COMPLICATIONS IN CATARACT EXTRACTION.*

By VARD H. HULEN, M. D., San Francisco.

It is not my purpose to discuss here all the complications and accidents incident to the cataract operation, but to touch on some important points where complications have arisen in my own cases or which have been seen in the practice of other ophthalmic surgeons, endeavoring to make a few generally helpful deductions.

From statistics, usually taken from large clinics wherein the operators are men of extensive experience with facilities approaching the ideal for doing successful surgery of the eye, we find the percentage of success in senile cataract extraction to be as large as 95 per cent. But you will agree that if it were possible to obtain accurate final reports from every cataract operation done, the good eyes obtained would not approach the above figures. If this is the case, the cataract operation never being one of emergency, might it not be advisable and entirely feasible for practically all cataract extractions in this country to be done by those only in our specialty particularly well equipped for this kind of work. This idea is thrown out here for your contemplation and for possible further discussion.

Through the law of averages all of us must eventually experience many of the disastrous complications in operating upon cataracts. For fifteen consecutive years I had escaped serious infection after an extraction, then two cases of panophthalmitis appeared less than a year apart.

It has been said that the loss of an eye to an ophthalmic surgeon is like the loss of the life of a patient to a general surgeon. But I say the loss of an eye following a cataract operation may be worse than death, for the blind eye or hideous stump or empty socket remains a living and often loud reproach to the operator the remainder of the patient's life, which may be a long one.

None of our text-books present anything like as fully as their importance deserves, the complications that the operator of even more than average skill may, and eventually does meet. In fact, some of the books scarcely more than enumerate the not uncommon accidents. There remains to us but to learn by experience of the actions and results of these complications and how they might have been better handled. To relate then some of our personal experiences with deductions may be mutually helpful even if we cannot always agree in our suggestions.

A complication in connection with the eye to be operated upon may be insignificant in itself, yet it may lead eventually to the most serious consequences. For instance, it was my bad fortune not long since to see in consultation a disastrous result with a good patient in the hands of an experienced operator, due probably to simple friability of the conjunctiva. Before the counter-puncture could be made, the conjunctiva tore, loosening the grasp of the fixation forceps; the section was therefore made a little smaller than was intended. This fault became manifest on presentation of the lens in the wound when pressure was applied for delivery. At the moment of enlarging the incision with scissors, the cataract dived to the bottom of the vitreous chamber; the eyes were then bandaged. The following day when I saw her there had been no pain, the patient was docile, the eye quiet, and what appeared to be the edge of the lens was seen below. The vitreous was fluid, however, and a skillful effort to extract the recalcitrant cataract was unsuccessful. The second night, during the momentary absence of the nurse, the patient was terrified by a temblor, pulled off the bandages, etc. The outcome was a tragedy for all concerned, due primarily, we may truthfully say, to a friable conjunctiva. The lessons to be learned from this case are, first, to be sure to get a secure fixation on the globe, include if necessary in the jaws of an efficient forceps the insertion of the inferior or internal rectus muscle; second, always make a section surely large enough—there is no danger, when properly placed, in making a section too large. Many times when extracting a cataract in its capsule I have sectioned one-half the circumference with no harm following. I attempt a conjunctival flap as a routine procedure to aid the corneal nutrition, as well as for its other advantages. In our endeavor to cut a sufficiently large section it is important to avoid a deep counter-puncture which may be a serious complication on account of excessive hemorrhage, more easily lost vitreous, as well as slow and painful healing from the scleral section.

Once I have experienced the complication of iridodialysis, and with ultimate loss of the eye. The patient was a female, 67 years old, with diabetes. I had successfully removed the complicated cataract from the left eye some months before. When operating on the right uncomplicated eye in her room in the hospital, just as I was making the puncture we were all startled by a loud knock on the door, the messenger announcing he had an important paper for the patient to sign. She became very nervous, and while at the first operation she was an ideal patient, now became unmanageable, and I hesitated about proceeding with the operation at this time. The section was completed, however, without mishap, but the instant the iris forceps were used, the patient jumped and squeezed the lens out in its capsule. No vitreous was lost, but there was a large prolapse of iris and the anterior chamber instantly filled with blood. The extruded iris was snipped off, but owing to the bad behavior of the patient it was impossible to do more without administering a general anesthetic; this for various reasons I decided not to do, and bandaged the eyes at once. And little reaction followed, the healing was slow but uneventful. When the blood had disappeared from the anterior chamber it was seen that the pupil was obliterated by the drawing up and inclusion of the iris in the corneal wound, and there was an iridodialysis both at the external and internal extremities of the section. A few weeks after the

* Read at the Forty-fourth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1914.

eye became quiet, decided increase of tension appeared with characteristic symptoms. A large iridectomy was then made. Glaucoma again supervened and Elliot's trephining operation was done, the tension was quickly restored, and hypertension soon followed. An anterior sclerotomy was now performed. But regardless of any and all treatment, increased tension was only controlled by posterior sclerotomy. The eye, however, would become irritable from time to time, the cornea more opaque until vision dropped from 20/100 to fingers to the temporal side only. Eventually enucleation became advisable, the other eye showing extensive retinal changes. A large quantity of albumin in the urine was reported, as well as 3 per cent. of sugar. In the light from this most instructive case I should in a similar condition use general anesthesia before closing the eye and clear the anterior chamber of blood, do an iridectomy and free the corneal wound of iris tissue at the least. The chances of a good result thereby would, I believe, have been greater.

How to act in the complication of an incarcerated or prolapsed iris is sometimes puzzling. We not infrequently see eyes apparently none the worse for an incarceration, yet we should do every practical thing to avoid or overcome such a condition. One patient on whom I had done a perfectly smooth extraction with an iridectomy, was progressing beautifully, but through an indiscretion on the sixth day during the absence of the nurse, opened the corneal wound at one angle and a tiny incarceration of iris ensued. Pain followed which nothing relieved until a general anesthetic was given sixteen days later and the pinched iris freed from the wound. During this entire time there was but moderate reaction, judging from the appearance of the eye; the pain, however, was continuous and excruciating. The complication appeared insignificant, but on account of it I experienced the worst three weeks of my professional life. All is well that ends well, and this patient came out with a perfect eye and more than normal vision for distance and reading. It is perhaps better surgery to relieve *promptly* a prolapsed iris no matter how small or even an incarceration if there are any kind of symptoms.

Recently I extracted a mature senile cataract from the right eye of a Chinaman at the City and County Hospital. All went well until the second night when the patient got out of bed and found his way to the toilet, and though he stayed "ony tweny thirly minit" considerable blood was found on the dressing and the corneal flap protruding between the lids, there had been a small intraocular hemorrhage. With a spatula the corneal flap was replaced but owing to the patient's continued activity the next day I found the cornea again protruding between the lids and the wound filled with a blood clot. Again the flap was replaced and as the patient, now that it was too late to do any good, became an ideal one, there was no further trouble. No useful vision was obtained up to the time he disappeared from my observation. This occurrence illustrates the harmful practice of permitting, as is sometimes advocated, any activity to the recently operated cataract patient.

Panophthalmitis has been a complication in three of my cataract operations, all men and charity cases. One was a very old tubercular subject with nephritis and a generally bad and septic condition, but he was anxious to have his second eye operated as the other had been a fair success. I yielded to temptation much to the regret of both of us afterwards. My second experience was a surprise, for the patient was apparently in excellent condition and I had just operated his other cataract successfully under the same circumstances. The operation followed by panophthalmitis was absolutely smooth with the least traumatism possible. Those who witnessed this extraction remarked the ease and simplicity of the performance. The patient's behavior then and subsequently was perfect. He later reported that some one kept leaving the window open at the head of his bed; a violent "head-cold settled in his eye" as he expressed it. Enucleation was done a week later on account of the severe pain. I learned subsequently that the argyrol solution used frequently some days before the operation as a precautionary measure, was from the same bottle regularly employed in the treatment of a gonorrheal ophthalmia case in this ward. Here was a possible source of infection for my patient. We must ever be watchful for infection from remote origins. The third man had been living in a stable and was saturated with the filth therefrom in addition to having ozena. A smooth operation was followed by a classical picture of panophthalmitis and I enucleated the eye on the sixth day. A successful extraction of the cataract from his remaining eye was done some months later, his ozena having been thoroughly treated in the meantime, as well as a more thorough preliminary preparation having been carried out preceding the second operation.

A point I wish to lay stress on just here is that one should probably have less infection, even the mild ones that simply prolong the convalescence of an operated eye, if we sent patients to the hospital several days earlier than is usual and could thus give their eyes, skin, air passages and general condition more careful attention, and a complete bacteriological examination of the operative field be made before the time of extraction. It will be noted that two of these eyes were removed during the height of the panophthalmitis and I have done several enucleations for panophthalmitis without regretting it. Yet I know this procedure is not without possible danger as I saw a death from meningitis follow enucleation during panophthalmitis while a hospital resident in the New York Eye and Ear Infirmary.

Now just a few words concerning the loss of vitreous, time not permitting further enumeration in this broad field. Prolapse of vitreous may be due to an involuntary contraction of the ocular muscles, even the recti sometimes participate, these patients express themselves as having had no sensation at the time other than the muscular action, apparently being under good control and not at all

nervous. An oculist friend related to me how he once divided the tendon of the orbicularis subcutaneously previous to extracting the cataract as he judged the patient to be a "squeezer." He did not see fit to repeat the experiment though he said it worked this time successfully. At other times the subject may be a "bad actor" during the operation; I have seen a patient squeeze his eye through seeming perversity. To forestall the loss of vitreous in the above conditions general anesthesia would be necessary unless one repeated the experiment of tenotomy. At other times the loss of vitreous (fluid or normal) is due to faulty judgment or awkward action of the operator himself. When working under local anesthesia the surgeon should have the patient under his "control," his manipulations must be gentle but firm and deliberate, the section must be made large enough, the capsule should be fully opened, being careful not to displace the lens, and when the cataract is delivered the eye must not be fussed with unnecessarily; misguided efforts to get out a little more soft lens matter may be fatal. Also I lay special stress on first getting and then retaining full anesthesia of the tissues manipulated. It is my custom to remove the speculum immediately after the iridectomy and, other things being equal, I should prefer not to use a speculum at all.

It is by good team work on the part of the patient, the operator and his assistants that the larger part of serious complications in the cataract operation may be avoided, or successfully corrected when they do appear. In my opinion it is mainly through the highly-developed skill of Col. Smith's assistant whose duty it is to control the eye, that he is able to show such few losses of vitreous in his method of extraction in capsule. It is probably the lack of this invaluable assistant that those who have had the benefit of a course in India under Col. Smith have not made good in this method on their return to America. . .

The crying need in medical California to-day is for efficient eye service. Many of our hospitals, palatial buildings with generous equipment and admirable service in general medicine and surgery, have no adequate department for the ophthalmic patient. Our efficient co-operation should soon correct this, or provide the ideal thing—exclusive eye hospitals.

Discussion.

Dr. Hugo A. Kiefer, Los Angeles, said: I like to dispense with the use of the speculum, as it removes a dangerous source of pressure on the globe, which favors the escape of vitreous. Old patients especially are apt to develop delirium, whether it is the result of the anesthetic, or of the operation, or of the confinement, and this should be guarded against. One occurred in my private practice. I am in favor of confining the patient to bed, or at least to a darkened room, for at least ten days, as infections and hemorrhages are especially prone to take place within that period.

Dr. Robert W. Miller, Los Angeles, said: I find nothing seemingly deserving criticism in the excellent paper read by Dr. Hulen. I wish, however, to emphasize the importance of a perfect toilet, and the best disposal of hemorrhage or incarceration of the iris in the wound, with recourse to general anesthesia when necessary. It may even be better for some of us to employ general anesthesia more frequently before beginning the operation. Again, the elimination of the speculum, or the limited use of it, is to be commended. This, of course, necessarily means that the operator should have a competent assistant. It is highly important that the operator and his assistant become accustomed to work together.

A source of danger that has caused me much solicitude, is the possibility of a sudden burst of light from a window following the operation. I find it unsafe in a general hospital to trust this matter to a nurse—even though carefully instructed to secure the window shades by means of adhesive plaster or of weights. It will be safer if the operator give this matter his personal attention, in order that the wind may not blow the window shade from its place or the sudden action of the spring, elevate the shade, permitting a sudden burst of light, thus causing the patient to start, forcibly close the lids, and damage or ruin his eye. It is my habit, before operating for senile cataract, to put the patient upon a course of preliminary treatment for a period of two to four weeks. This course consists of giving one's attention to elimination and special attention to the condition of the nerves. Of course, we all aim to give our attention to the condition of the conjunctiva and lachrymal sac.

Dr. P. A. Jordan, San Jose, said: I wish to mention an operation of my early experience in California. An aged Spanish woman, blind in both eyes for years, was placed on the operating table. At the completion of the puncture and counter puncture, she screamed, and forcibly ejected the lens and much of the vitreous. The eye was dressed. The operator being much depressed, stated that he would enucleate the ruined eye in two days. To his surprise, two days later, the eye was found in a healthy condition, and rapidly healed, giving useful vision. I have had several cases of post-operative delirium. I think this is often associated with constipation, and relief is often obtained by a dose of five grains each of calomel, jalap and sodium bicarbonate. It is my custom to bind into the bandage, a copious black cloth, covering frontal region, cheek from ear to ear, and well down to the tip of nose.

Dr. G. H. Kress, Los Angeles, reported: Case of auto-extraction in a Mexican laborer who knew no English, who, after the corneal section, through squeezing of the globe, was able to do an auto expulsion of his lens, before the iris forceps could be used. Owing to the fact that the patient would not roll his globe downward, a successful iridectomy was impossible, and when the vitreous began to be present, the eye was bandaged, and the patient was sent back to bed, and then given full instructions in regard to absolute rest and not straining. The patient was at all times somewhat unruly, and next morning, in spite of orders for rest, patient was found getting out of bed, etc. In spite of all this, the wound healed with slight iris incarceration, a pupil with dull reflex near the fundus, and a blood clot (which went on to resorption), and next to inferior sphincter margin, a capsular cataract or arc. About six weeks later, a secondary capsulotomy was done, down and in. Patient was discharged later with a vision of about six-twentieths. The unruliness of this patient, and this experience, goes to emphasize the previous remarks on the great importance of proper education of the patient prior to operation.

Dr. Kaspar Pischel: One of the most important measures for preventing accidents at cataract operations is the training of the patient. While comparatively few patients have a good control of their eyes at the first sitting, a few days' training will make most of them quite tractable. I teach the attendant to take hold of the upper lid and let

the patient look down. This should be done a number of times a day. The saddest complication is probably an internal hemorrhage during or immediately following the operation. I hope the essayist will never experience one.

Dr. W. H. Dudley, Los Angeles, said: I think I have had my share of complications, but one was reserved for last year, which I had not seen before. A woman, age about seventy, from whom I had extracted a cataract from the right eye three years before, came with a cataract in her left eye. Examination showed it to be mature, but not hyper-mature. The patient was enjoying good health, and examination of the urine was negative. The corneal section was made at the limbus, was correct, and the behavior of the patient was excellent. Almost immediately after the section was made, liquid vitreous began to flow out of the section. With an instrument, the lens was lifted out of the section without further loss of vitreous, and the eye dressed with bandages. The wound healed in forty-eight hours, with little reaction, and a week later the patient could tell the time by the watch with a plus 13 D. lens. Soon, however, some pain was complained of, and slight pericorneal redness persisted, and the tension was —1, which continued for some few months, when she was lost sight of, at which time a pupillary membrane had formed which rendered the eye valueless for sight. This shows that an eye which reacts functionally, as a healthy eye should, with all appearances of a healthy eye, as cataract eyes go, may be diseased after all.

Dr. B. F. Church, Redlands, said: Fixation forceps should be replaced in cataract operation by a small fork. The globe can be held more steadily than can ordinarily be accomplished with the forceps. It has the advantage of not folding up the conjunctiva, and gives a firm resistance for puncture and counter puncture. Its use is less painful to the patient.

Note: The paper was also discussed by Dr. Deitling of Los Angeles, and Dr. L. Deane of San Francisco.

Dr. V. H. Hulen, San Francisco, closing his own paper, stated: He had never had delirium follow extraction, and believes this experience due in great degree to preliminary preparation of patient physically and mentally. He uses Ring mask, and thus dispenses with a dark room, and thoroughly protects eyes from accident. Artificial light would be desirable if we had an inspired person to hold it in required position.

In regard to operation in bed, he would like an operating-room, admitting the bed, and wishes hospital builders would arrange for eye patients, as their requirements are peculiar to themselves, and so necessary for good results. He could touch on but few complications in paper, so limited it to personal experience.

THE PREVENTION OF TUBERCULOSIS IN CHILDREN.*

By T. C. McCLEAVE, M. D., Berkeley.

The finer diagnostic methods of recent years have led many investigators to the conviction that tuberculosis is essentially, in its origin, a disease of childhood. The occurrence, before the age of puberty, of positive tuberculin reactions in almost all individuals tested; the revelations of the Roentgen ray as to the frequency of diseased bronchial and other lymph nodes heretofore largely overlooked; the similar disclosure of incipient lung changes; the significance of all of which, being confirmed by the necropsy findings in the bodies of a large proportion of the children coming to autopsy, indicates that infection with the tubercle bacillus is commonly an incident of very early life.

The ultimate solution of the problem of the eradication of tuberculosis must lie, it would seem, in the prevention of this early infection.

Prophylaxis should begin before conception; that is, no manifestly tuberculous woman should become pregnant. This is a matter, however, at present largely beyond control and many babies must unavoidably come into the world handicapped by such parentage.

This is not to say that the mother transmits tuberculosis directly to her infant in utero, which rarely occurs, or even that she endows it with a peculiar susceptibility to the disease, as has been so generally taught; but the child of a sick mother is necessarily born with impaired vitality into an environment which offers exceptional opportunity for early infection. The association of mother and infant is ordinarily so close that a mother with open tuberculosis could only by most extraordinary precaution avoid infecting the child, and the danger is but little less where the father or other members of the household are tuberculous.

Ten thousand children under five years of age die of tuberculosis each year in the United States, and of these seventy-five per cent. are of tuberculous parentage. A small proportion of these cases are possibly of the true congenital type, while a few others may perhaps have been infected at the time of birth, but the source of infection in the great majority is of course the sputum of the mother or other tuberculous member of the family. The evidence is indubitable that tuberculosis is preeminently a house disease, and that early life is the period of greatest susceptibility.

Not only is maternal tuberculosis an important consideration in respect to the future welfare of the expected child, but is of tremendous importance in respect to the usual disastrous effect of child-bearing on tuberculous women.

Tuberculosis is one of the gravest complications of pregnancy and may, in a considerable proportion of cases, present a definite indication for therapeutic abortion. It is estimated (Bacon) that there are about 32,000 tuberculous women pregnant every year in the U. S. Between 44,000 and 48,000 women of child-bearing age die of tuberculosis every year, about one-fourth of whom have passed through pregnancy within the year, or in other words, one-third of all tuberculous pregnant women die within one year. These figures, with what has previously been said of the infection of the offspring of these women, gives some

*Read before the Alameda County Medical Society, September, 1913.